

City Document.—No. 21.

CITY OF BOSTON.

Boston. City Physician's Office



Annual report

A COMMUNICATION

FROM THE

CITY PHYSICIAN

ON

ASIATIC CHOLERA.

IS IT A CONTAGIOUS DISEASE ?

1866.

In Board of Aldermen, January 29, 1866.

Laid on the table, and 1,000 copies ordered to be printed.

Attest :

S. F. McCLEARY,

City Clerk.

CITY OF BOSTON

The President's Office, January 27, 1884
To the Mayor and Garrison, Health Commissioners &c
City of Boston.

Dear Sirs: On the second of October, 1883 (City of Boston Report, p. 10), I had the honor to receive your honorable body's communication on the subject of Cholera, in which you expressed your interest and anxious desire to have the disease eradicated from our city.

With regard to the point raised upon in the dispatch of the 27th ult. I should like to state that the question of the disease has been the subject of the most careful attention of the Health Commissioners. The report of the Health Commissioners, published in the City of Boston Report, 1883, on page 10, contains a full and complete account of the disease and the measures taken to prevent its spread. The report also contains a full and complete account of the disease and the measures taken to prevent its spread. The report also contains a full and complete account of the disease and the measures taken to prevent its spread.

MAR 3 1864

CITY OF BOSTON.

CITY PHYSICIAN'S OFFICE, JANUARY 27, 1866.

TO THE MAYOR AND ALDERMEN, *Health Commissioners of the City of Boston.*

GENTLEMEN: On the second of October, 1865 (City Doc. No 73), I had the honor to present to your honorable body a communication on the subject of Cholera, in which, when speaking of the contagious and infectious nature of the disease, I stated as follows, viz:—

“ With regard to one point, touched upon in the despatch alluded to, I should differ from the opinion there expressed by Mr. Morris,—the contagiousness of the disease. From the best evidence, Epidemic or Asiatic Cholera, is neither infectious nor contagious. The experience of the physicians and attendants at the Cholera Hospital, organized in 1849, on Fort Hill, an experience extending over a period of four months and a half, and based upon the treatment of more than two hundred and fifty patients, fully warrants this belief.

“ “ There were about twenty-five attendants in the Hospital, exclusive of medical officers, at different times, all of whom were more or less constantly in proximity to the subjects and their excretions, and many of them were only for a very few

hours at a time out of the ward. Four physicians and four medical students were engaged in the duties of the Hospital; two of the latter for a short period only. Of the others, the students were untiring in their devotion to the sick, often irregular in their meals, and having a much smaller allowance of sleep than nature is supposed to require. The physicians spent from six to eight hours daily in the house, until about the close of the epidemic, and when the number of patients was large, were often engaged in the duties properly belonging to nurses. Of all these attendants, but two had the symptoms of the disease, and in one of these they were not all present, and in the other the most marked early symptom (rice-water discharges) was entirely wanting. Two of the attendants had cholera at the time they entered the house, and neither of these had any return of the disease. The diet of the attendants was not restricted. Meat, fruit, vegetables, even salad, puddings, etc. were freely partaken of.' (City Document No. 66; 1849, Report on the Cholera in Boston.)

“This would seem to settle the question of its being propagated from one individual to another, and ought to allay all fear upon this head which may exist in the community. It is a true epidemic; extending in its course along the great highways of the world; developing itself at the centres of population; seldom spreading into rural or sparsely settled districts, and in its increased and diminished intensity during different periods of the same invasion, under the control of atmospheric and hygienic influences. Whatever tends to lower the vitality of individuals or communities, to diminish their power to resist disease, acts directly to increase the susceptibility to any epidemic, and it follows necessarily, therefore, that the more perfect the sanitary condition of a city or community, having regard not only to the common nuisances, so called, but also to the general social condition, the more perfect will be the protection from cholera or any other disease of like epidemic form, and *vice versa*.”

The consulting physicians also, in their Report (City Doc. No. 95), under date of November 11, 1865, took the same view.

“ Under a deep sense of their responsibility in expressing the opinion, the consulting physicians unequivocally declare their conviction that the disease is neither contagious nor infectious; that it cannot be propagated by being near the sick, nor by handling the secretions or excretions from bodies of the sick or of the dead. The disease is epidemic, and cannot be restrained or controlled, in its progress, by quarantines or cordons of any kind. It can be controlled by temperance, chastity, and, above all, by perfect cleanliness, and by these only.

“ The consulting physicians, being of the opinion that neither quarantines by sea, nor sanitary cordons by land, have ever been found, or can be made, effectual in protecting cities or communities from the visitation of cholera,” * recommend that no such restrictions be made; but, in order to produce tranquillity in the public mind, and from respect to the opinions of those who think differently, they think it might be well that vessels coming from places in which the disease exists should be made subject to the visitation of the Port Physician; but that none of the passengers or crew should be in any way restrained from freely communicating with their friends on shore, or with the city, or from landing at any time with their personal baggage and effects; and no vessel should be detained in quarantine longer than is absolutely necessary to put her in a cleanly condition.”

Since then evidence has been accumulating, so direct in its bearing upon this point, and from sources so reliable, that I have been compelled to change my opinion. The vital importance to this community, of thoroughly appreciating and clearly understanding the modes by which cholera is propagated from one locality to another, as noticed abroad, and a deep feeling of my own responsibility in the matter, has induced me to lay before your honorable body, somewhat at length, the evidence upon which this change of opinion has been based.

* See City Document No. 29, 1848.

The sources of this evidence are the medical journals of this country and Europe, especially the *London Medical Times and Gazette*, and the *Archives Générale de Médecine*, of Paris, in which are to be found reports and papers upon this disease and its progress, from the earliest history of the present epidemic; many of them written on the spot where the epidemic was raging, and accepted by the profession at large as entirely credible authority.

It is proper to state, here, as preliminary to the introduction of the evidence, and also for the reason that confusion as to the identity of the diseases sometimes arises from their similarity to each other to a certain extent, that there are three diseases, all of them characterized by excessive action of the alimentary canal, and all of them going by the common name of cholera, which are entirely and essentially different.

These are, first: "Cholera Morbus," so called, but which, for greater scientific accuracy, an English writer proposes to name "Endemic Hepatic Cholera;" "Asiatic Cholera," or, more properly, "Epidemic Intestinal Cholera;" and a disease more rarely known, but well recognized, for which the same writer uses the term "Septic Cholera."

The first of the three occurs under the influence of the seasons; originates in excessive action of the liver; affects, it may be, many persons at a time; and occasionally proves fatal; but never spreads by intercommunication, nor moves from country to country. (Those who are curious may find in the journal from which the foregoing is taken — *Medical Times and Gazette*, Sept. 7, 1865 — very satisfactory reasons why cholera morbus does not generally occur in the early months of the year, but always "returns in the autumn as surely as the swallow returns in the spring.")

The second is not controlled or affected by season or place. It may begin with a single case, or great numbers may be seized at once. It has a tendency to spread from its original starting-point, moves from country to country, and, in the main,

presents the same symptoms wherever it goes. These symptoms are, an excessive secretion from the mucous membrane of the alimentary canal, while the function of the liver is either unaltered or entirely suspended.

The third is caused by the absorption of the poison which emanates from decaying animal or organic matter, and is seen in those who dissect in ill-ventilated rooms, and frequently occurs among persons who are employed in removing night soil, or cleaning out sewers. I have been informed that well-marked cases of this have been noticed amongst the medical students at the College in this city, and the outbreak of sickness in the Home for Aged Females, in Charles Street, reported to this office by Dr. Francis Minot, physician to the Home (city document No. 73, 1865), was, undoubtedly, an instance on a large scale, twenty-seven of the inmates having been attacked in one night. A peculiarity of this last affection is, that after a time, those who are subjected to the influences which produce it, lose their susceptibility and are no longer affected, until the practice of the art or calling which brought them into daily contact with the cause, having been intermitted for a while, the party returns to it again, — a fresh man as it were, — once more to acquire a tolerance, by passing through another seasoning.

Between the 1st and 20th of May, 1865, an almost incredible number of pilgrims assembled at Mecca, to celebrate the great feast of sacrifices, one of the most sacred festivals of the Mahometan calendar. Here was the outbreak of the disease, the starting-point of the cholera. The following extract from a report made to the Emperor by the French Minister for Foreign Affairs, will show how this occurred: “The information, gathered from the consular agents, and confirmed by the unanimous report of the physicians, manifestly proves that the epidemic has been imported into Egypt by pilgrims returning from Mecca and Djeddah. Thus it is alleged that the cholera exists every year among the caravans of Mussulmans arriving at these holy cities after fatigues and privations of every kind,

which render them more liable to malady. This predisposition is singularly favored by the state in which these multitudes live, — camping in the open air, exposed to a torrid heat, and to the influence of the pestilential miasma given forth by heaps of impurity and the putrefied remains of animals offered in propitiatory sacrifices. These permanent causes of infection have been still more active this year, by reason of certain facts, which may again occur, and which we consider we ought to point out to your Majesty's attention."

"Upon the one hand, the number of pilgrims collected at Mecca for the Kourban-Beiram (feast of sacrifices) was, owing to a particular circumstance of the Mussulman rite, far more considerable than in preceding years. The number of individuals, of all ages and both sexes, arrived from the various Mahometan countries to go through the consecrated ceremonies, was estimated at no less than 200,000, and the quantity of sheep and camels slaughtered, the offal of which was abandoned on the ground, exceeds a million. It is not astonishing that this agglomeration of human beings, and this enormous quantity of animal substances in decomposition, should have developed, in exceptional proportions, the conditions of insalubrity which the pilgrims habitually encounter."

"Upon the other hand, it is to be remarked, that in former times, the principal movement of pilgrimage was carried on by land, and that the passage of the desert contributed to improve the hygienic condition of the caravans, by isolating and dissipating the morbid elements they carried with them. Nowadays, on the contrary, thanks to the facility and resources of steam navigation, it is by sea, and in a very short space of time, that these voyages are, in great part, accomplished, by the aid of packets, upon which are crowded thousands of Mussulmans of every nationality. This accumulation, added to the shortness of the passage, is certainly one of the causes which most contribute to the development of epidemic centres."

This testimony of M. M. Drouyn de L'Huys, with regard to

the cause of cholera, is not alone. According to a native Hindoo physician, cholera is sometimes developed in the caravans of pilgrims to Juggernaut, and the epidemic of 1848 has also been traced to a similar origin, — the assembling of 165,000 pilgrims at Tantah, in the delta of the Nile, in July of that year, who had come from all parts of Egypt and Syria to celebrate the festival of a Mahometan saint. Immediately on the dispersion of this concourse, the disease appeared in Alexandria and Cairo, and 3,000 were said to have perished during the festival, at the place where it was held.

Proceeding from Mecca, cholera made its appearance at Alexandria on the 11th of May, 1865, near the railway station. The place where it showed itself is one of the lowest suburbs of the city, and inhabited by a large population of the lowest class. It spread amongst the Arabs, who, in addition to the loathsome filthiness of their dwellings, were drinking water in an almost putrid state, from the low state of the river and the decomposing matter derived from many hundred carcasses of dead animals lying in it, but scarcely attacked the European portions of the town.

On June 12, a few cases appeared at Ancona, a seaport of the Papal States, situated on the Gulf of Venice, between which and Alexandria there exists the most perfect communication, and which is, and has been for a long time past, the port of the Southern States at which the largest trade is carried on.

Dr. Mulig, Physician to the Prussian embassy, and to the Imperial Naval Hospital at Kassim-pacha, reports, that on the 28th of June, the war frigate Mouchbirisourour arrived directly from Alexandria. Until this time, “no case of cholera or of its prodromes, such as diarrhoea, sporadic cholera, or gastro-intestinal affections were observed at Constantinople.” No sickness being reported on board, the vessel was permitted to come to anchor; but, on the same evening, twelve patients were sent to the Marine Hospital, eleven of whom were recognized to be suffering from incipient cholera, and one in a state of collapse,

which terminated fatally during the night. On further questioning, the surgeon of the steamer stated, that on the voyage two of the crew had died of cholera, and although, when at Alexandria, no cases of cholera had occurred on board, diarrhoea had been noticed. From this steamer, as from a centre of contagion, the disease spread in all directions. To quote Dr. Mulig's report: "The facts speak for themselves. Up to the 28th of June, nothing in the hygienic condition of the city announced an epidemic of cholera. On this day, the frigate Mouchbirisourour arrives from Alexandria, with cholera-sick on board; they are landed at the arsenal, and not five days pass before the first case occurs in a patient from the military workmen's barracks, situated hardly ten steps from the landing of the arsenal. From this day, cases multiply in the arsenal, and on board the vessels anchored there; thus, the corvette Ismir is the first attacked, being, at the same time, nearest the barracks; and it is only a few days more before the transports, anchored a little further off, are visited by the disease. The guard of Parmak-capon, at the entrance of the arsenal, and only a few paces distant from the barracks, is roughly dealt with in its turn; finally, the rest of the guard and the workshops are infected. In the mean time, the corvette Ismir is towed to the exterior port, where she remains for forty-eight hours; the cholera continuing, she is removed to Bouyouk-liman; several days later, the first case of cholera appears in the exterior port. On the other hand, the citizen-workmen, employed at the arsenal, propagate the disease in Kassim-pacha. If we turn to Yeni-Keny, which is a considerable distance from the point of origin, we find here, also, that the disease is propagated from the arsenal, for the first established case is that of a stone-mason from Kassim-pacha, arriving, already sick, at Yeni-Keny, where he dies the next day, with all the symptoms of cholera. . . . Is it a contagious disease, or do you wish to quibble upon the word? Let us state, then, the fact, it is this: *cholera patients import cholera.* Do you wish an additional proof? that

which has happened to the Marine Hospital itself may furnish it. The first cases of cholera having stayed at the hospital hardly longer than a few days, the patients remaining there for other diseases were affected, and succumbed under the attacks of cholera. The fourth ward, where the first case of cholera, of local origin, was observed, entering on the 3d day of July with simple diarrhœa, has furnished, subsequently, several other cases. Among the employés, the first victims attacked were a nurse of the cholera ward and two washermen who cleaned the linen of the cholera-sick."

"Cholera does not appear to be contagious by simple contact of the patients; but the cholera patients rather develop contagion like those affected with smallpox, with this difference, that whereas, in smallpox, contagion is communicated by the skin, in cholera it is through the excretions, especially the stools, that the infection is propagated; thus, the linen stained by cholera patients, houses occupied by them, infected ships, may harbor the contagion for a long time, and become the cause of new infections. It must also be observed, that the stools of persons suffering from mild manifestations of the disease, from cholérine and cholera, like diarrhœa, do not contain the contagion any less than the excretions of those suffering from confirmed cholera; it is, therefore, easy to conceive why a ship, a building, etc., may be affected without a case of cholera having occurred." (*Med. and Surg. Reporter*, Oct. 21, from *Gazette Médicale d'Orient*, Aug.)

On Sunday, June 11, a vessel arrived at Marseilles from Alexandria, which port she left the 1st of June, bringing sixty-seven Algerian pilgrims, who came from Mecca, by way of Djeddah and Suez, where the cholera was prevailing at the time. At the date of their landing, there had been no cholera at Marseilles; indeed, the first information of its being at Alexandria was brought by this vessel. Two of these pilgrims, it is known, died on the voyage, and another on landing. On their re-embarking for Algeria, the people of that quarter of the

city from which they sailed mixed with them, and assisted them in loading their baggage. It was in this locality that the first cases of cholera appeared. It did not, however, long remain confined to this part of the city; for, on the 22d of the month—in eleven days—cases appeared in other parts of the town.

In the short space, then, of about a month from the time of its outbreak at Mecca, cholera had become established at Alexandria, Constantinople, Ancona, and Marseilles, four great centres, virtually commanding the whole of Europe, and parts of Asia and Africa; for between these points the greater part of the traffic between the West and the East flows.

Beyond these limits, it is difficult to trace its progress with that certainty as to facts of contagion which are so clear thus far; but it may be remarked that it was at Southampton that the first cases in England made their appearance, this port, as is well known, being in direct communication with the infected ports in the Mediterranean by mail steamers, and only four days distant, in time, from Gibraltar, where the disease was raging.

Of a similar nature is the evidence furnished by the course of the epidemic in this country in 1848: "It was the last week in November, 1848, that it manifested itself at sea, on board of two emigrant vessels, bound, the one for New York, and the other for New Orleans, when they had been out, the former sixteen days, and the latter twenty-seven days, from Havre, which was unaffected at the time of their departure. The circumstances attending the nearly simultaneous appearance of the disease in two vessels traversing the Atlantic, and about a thousand miles apart, are among the most curious on record in the history of epidemic cholera. The disease did not extend beyond the limits of the Staten Island Hospital at New York, after the arrival of the infected ship there; but at New Orleans it seems to have spread rapidly, not only in the hospital, but in the city generally, although it did not exist at the time in any other part of the United States. It appeared at Memphis

towards the end of December; at St. Louis, in the first week in January, 1849; and at several places on the Upper Mississippi in March. Chicago and other towns situated on the chain of the great lakes were affected in May. It was not till then that New York was visited by the epidemic, notwithstanding the importation of the disease at Staten Island, and the occurrence of several cases in the hospital there six months before. Nearly about the same time, Philadelphia, and the chief cities on the seaboard of the United States, became affected."

"In 1832, it was developed first in the locality where the first vessel that ever came to this country with cholera on board landed her passengers. It followed the arrival of the brig *Amelia*, which put in at Folly Island, on the coast of South Carolina, in a stranded condition, and the only cases there — no cholera having been noticed before — occurred among those who had been employed about the wreck. At Detroit, the first cases made their appearance after the arrival of the steamer *Henry Clay*, in July, 1832, which had cholera on board. It broke out at St. Michaels, a previously healthy village, on the eastern shore of Maryland, just after the landing of Captain Dodson, who died the morning after his arrival. It appeared amongst the Indians, after the interment of a corpse, dead from cholera, by them. It was brought to Illinois by Captain Blake-man, who had been to St. Louis, where the cholera was, and died of it on his return. It was not seen at Key West until the arrival of the *Ajax*, in a distressed condition, which had sailed from New Orleans, where the disease was prevailing, and which had the cholera on board at the time."

The Constantinople correspondent of the *Medical Times and Gazette* an eye-witness, and who fully corroborates the facts of Dr. Mulig's report, writes as follows: "If any one should still have entertained any doubts about the contagious nature of cholera, these must have been finally dispelled by the circumstances attending the last epidemic here, which I shortly described in a previous letter, and which were almost identical

with those observed during the visitation of the same disease at the time of the Crimean war. Then, the French troops, who had come from Algeria, where the disease devastated the country, had scarcely been disembarked at Gallipolis, when the cholera broke out amongst the people there. From this place the disease followed the French to Varna, where it decimated the inhabitants, sparing, however, the intermediate centres of population, and more especially Constantinople, with which the French had not had any communication. At a later period, a camp was formed on the heights of Maslac, the *échelon* of which was Yeni-Keny, in the Bosphorus. This had scarcely been done when the cholera appeared at Yeni-Keny, but in no other quarter of the metropolis. It was only after some time that the disease invaded Pera, the nearest suburb to Maslac, with which the troops lodged in these camps had had frequent communication. Such observations as these are almost as convincing as physical experiments; they show the connection between cause and effect as clearly as it can be shown in pure science."

Of the same nature are the facts reported by Dr. J. Swinburne, Port Physician at the city of New York, who (*Medical and Surgical Reporter*, January 13, 1866) has published an account of "the cholera, as it appeared at the port of New York in 1865." The *Atlanta*, an English mail steamer, sailed from London on the 10th of October, while that city was perfectly healthy. "On the 11th, she arrived at Havre, remaining only one day, and receiving 24 additional cabin and 540 steerage passengers, mostly from Switzerland, the northern part of Germany, and eastern France, all, with few exceptions, passing through Paris on their way to Havre, some remaining only a few hours, others for days, in the metropolis, when already, at that time, cholera was reported to prevail, although to a limited extent, and of a mild type. Among these were two families from Germany, who remained a day at the hotel, 'City of New York,' at Paris, and five days at the 'Weissen

Lamm' and 'Hullgarder Hof,' in Havre. While at these hotels, emigrants who had arrived only a few days before them were taken ill, visited and attended by Government officials, and, by their orders, sent to the hospitals. The Atlanta sailed again on the 12th of October; on the 13th, the first death from cholera occurred, in the person of a little child in the family from the 'Wiessen Lamm.' On the 14th, 16th, 18th, 19th, and 22d, five deaths from cholera occurred in one family from the 'Hullgarder Hof.' On the 22d, a friend of the family, also from the 'Hullgarder Hof,' but in the second steerage, sickened and died on the 24th. On the 28th, the first cases occurred in the third steerage; three of the emigrants from London were taken ill on the 30th, all of whom, however, recovered.

"The Hermann, which sailed from Havre at the same time with the Atlanta, arrived at the lower quarantine on the 26th of November. The physician in charge reported seven deaths, — four children, three adults. The former he reported to have died of diarrhœa and inanition; the three adults of disease of the heart, inflammation of the bowels, and premature parturition after a few days' illness. Singular, however, that the first death occurred in the very family who had lost the mother at the 'Hullgarder Hof' at Havre, and whose disease and death, after thirty-six hours' illness, the illiterate peasant, her husband, so graphically described, that no doubt whatever could exist that she died of cholera asphyxia.

"That cholera prevailed in Paris, and to some extent in Havre, has been admitted by all, and what is still more significant, the Atlanta, the Mary Ann, Hermann, and Harpswell had each names on the passenger lists which were not among the passengers, but reported to have been sent to the hospital by the local authorities at Havre."

Since writing the above, my attention has been called to a "Report on Spasmodic Cholera, prepared by a Committee under the direction of the Counsellors of the *Massachusetts*

Medical Society," published in 1832. This Report is signed by Dr. James Jackson, as Chairman, a name which is a sufficient voucher that the extracts are fairly quoted, and from reliable sources. The Committee express no opinion of their own, but have presented the facts which they were able to derive from all the sources at their command, in a most ample and impartial manner. That portion which discusses the contagiousness of the disease is well worth the study of every one who is desirous of arriving at a conclusion on this point; and I have thought that such extracts as space will permit might aid us at the present time in settling the question. No objection can be urged that these do not apply to the present epidemic, for Dr. Russell, who was familiar with the disease as it first appeared in India, states, in regard to the epidemic of 1832: "After a careful examination of all the symptoms of these cases, in different stages of the disease, I do not hesitate to state my unqualified conviction of its perfect identity with the Indian spasmodic cholera," and there is no doubt as to the identity of the present disease with that of 1832. The facts, therefore, have as direct bearing on the main question at the present time as then.

"About the middle of May, 1825, a convict was sent from a village, where cholera had appeared, to Chanda, eighty miles to the westward. Two hours after his arrival at this place he was attacked with the epidemic, and in two hours Mr. Montgomery saw him; but in twelve hours from the first attack he was dead. He was carried out for burial by four other convicts: three of them were attacked on that and the next day with similar symptoms, and two died in eighteen hours. A native, who gave them their medicines, was seized with the cholera on his return from the jail, and nearly perished. The disease now spread among the convicts (those only who had been in communication with the persons who labored under it suffered), and six died in as many days. Further: four policemen, escorting treasure from a distant village to Chanda, passed a night at

Mhool, where the disease was then raging; the next day two of them were taken ill on the road, and died in six hours. The other two, a few hours after their arrival in Chanda, were seized with cholera and died, likewise within six hours."

The following extracts are from Kennedy's *History of the Contagious Cholera*. They were taken from the reports of Medical Officers in India, published by order of government.

"The cholera first appeared amongst the inhabitants of this place (Ghooty) immediately after the departure of the first battalion of the 16th regiment, amongst whom it had been raging during their march from Hyderabad, and during their three days' continuance at this station.

"There is one fact certain, that his Majesty's 34th regiment carried it with them from Bellary to Nundydroog, and that there was no trace of the disease in the villages on the road. Since the regiment passed, every village on this road has been invaded.

"A detachment of Europeans from Madras, under the command of Major Wahab, arrived here with the cholera amongst them. The disease first attacked these troops at the Kistnah, after exposure to a heavy storm of wind and rain, and it continued with them from thence to this place, although all the villages in their route were entirely free from the disorder. During the march, sixty individuals perished, of whom eight were Europeans. On its arrival here, the detachment encamped about two hundred yards in front of our artillery lines. In this new situation, three Europeans and a number of natives died. At this time no case of cholera had occurred in the encampment. The Europeans, however, of Major Wahab's detachment mingled with our party of artillery; and, in the course of four or five days, the disease began among the latter. Several were severely affected, but they all recovered through the prompt medical assistance afforded. The next seized was the wife of a conductor, in the artillery lines. She was attended for a couple of hours by her friend Mrs. Gray. Mrs. Gray was seized soon

afterwards, and died the ensuing morning. The son of the latter, a boy about six years of age, was infected the day after his mother died, and recovered. My sub-assistant, Mr. Hoskins, who was constantly with the sick, contracted the disease and died in twenty-four hours. Another acting sub-assistant, Mr. Sleven, who attended particularly to Mrs. Houghton, a patient that had suffered severely, was attacked; and, Mr. McDougall, an assistant-surgeon, who was much among the sick, was also seized. From the artillery lines, the disease travelled to the bazaars, and many of the natives were carried off. The men of his Majesty's 30th regiment, who were in barracks about half a mile to the right of the line, completely escaped, not a man having been affected or any of the followers.

“I beg to add that Mr. Jones, surgeon of the 6th Light Cavalry, has just arrived from the Kistnah, by the same route as Major Wahab's detachment pursued. Mr. Jones states that he found the cholera prevailing in every village, having commenced soon after the passage of Major Wahab's detachment. The inhabitants said they had got it from that detachment.

“Of the European patients in Field Hospital for other complaints, three were seized with cholera after patients had been admitted with the same disease. Of these new cases, two, one on each side of the ward, were at the part nearest to that which had been appropriated to the reception of cholera patients.

“Orderly Sepoys, attending on the sick, were so generally attacked, that their attendance came to be enforced with difficulty.

“The disease has travelled in the very face of the wind from village to village, from one military station to another, and *in the exact route of troops*. From Nagpore to Jaulnah, from Jaulnah to Aurungabad and Mulligaum, from Aurungabad to Seroor, and from that to Bombay. It has progressively visited the different villages between this and Hyderabad. At Hyderabad two officers have lately fallen a sacrifice to the malady. One of these had constantly attended the deathbed of the other, and he himself was a corpse forty-eight hours after.”

In 1831 Drs. Russell and Barry were sent to Russia by the British Government, particularly to ascertain if cholera was contagious. Dr. Russell had passed several years in Bengal, and was familiar with the disease, and disbelieved in the contagious nature of cholera. From the evidence they obtained at St. Petersburg, both he and Dr. Barry became satisfied that it was contagious. From their official reports the Committee make copious extracts, amongst which appears the following :—

“ *City Prison.* — From the moment that the disease was proclaimed, the strictest precautions were adopted ; no person was admitted without medical examination ; rooms were set apart for a cholera hospital, and persons of both sexes appointed to attend the cholera cases, should any occur. Dr. Bish, who resides within the walls of the jail, and who, it must be observed, *was* an anti-contagionist, as acknowledged by himself, showed us a plan of the prison, illustrating the introduction of the disease amongst the prisoners, led us round the whole building, and communicated to us the following information from his journal, which had been most accurately kept : ‘ A woman had been sent out some weeks before to be treated for a syphilitic complaint in a public hospital. Her husband was also in confinement at the time, in a different part of the building, but remained. The woman was returned to jail, on the 23d June, O. S., with a diarrhœa upon her. She saw and embraced her husband for a moment, as she passed on to be placed in the room of observation. In a few hours she was seized with true cholera, and died that night. This was the very first case. The next persons attacked in the prison were three women in the same room with the former, one of whom had rubbed the deceased. These three died all within three days after the first. The next prisoner attacked was the husband of No. 1 ; he lived in a separate part of the jail. After this man, others in his room, all numbered on the plan, and registered in Dr. Bish’s journal. In short, of twenty-seven attacked (fifteen dead), there is but one to whom communication cannot be traced. He was confined

for a capital offence, and had less liberty than the others. There were about four hundred prisoners and attendants: the former are well kept and treated with great indulgence. None of the noble class, who are lodged in a separate part of the building, were attacked."

Dr. Philipp Doepp, Director-in-Chief at the Foundling Hospital, St. Petersburg, reported, as the result of his observation, that —

"The illness did not make its appearance in several sections of the house at once, nor did it attack several individuals simultaneously; but on the 19th one person in A., on the 21st one in B., on the 22d in C. No. 16, and finally, but only on the 24th, and that singly, in several sections.

"In some of the sections it was late in showing itself; *e. g.* in the fully inhabited one, H. not till the 26th, and only on one person; others have had no sick at all, as N. and O.

"In each division, at least two days of interval elapsed from its first appearance, before more persons were seized.

"In no part of the house did it make its appearance by attacking persons who had been confined to their sections. The persons attacked were always those who went freely about in the house and city, and consequently might receive the infection from out of doors.

"The illness raged with the greatest violence in the sections from which the sick were not promptly removed; *e. g.* in A., where No. 1, the first person (a female) in the whole house who fell sick, remained three hours; in F. almost entirely inhabited by free men (handicraft), who did not allow themselves to be removed, until they could no longer conceal the complete development of the disease. In F. the family of the coppersmith, Ahl, consisting of five persons, three of whom had the disease very severely; they had, by entreaties, succeeded in obtaining leave for the father not to be sent to the hospital, which was the more readily granted, as the family live quite separate, and only the father had any communication with the other workmen. A

fourth of the family, a young girl of seventeen, became ill, but so slightly that she has not been recorded."

Mr. Surgeon Juke states, from experience in Bombay:—

"I have had no reason, however, to say that the cholera has been contagious at this place. Neither myself nor any of my assistants, who have been constantly amongst the sick, nor any of the hospital attendants, have had the disease. It has not gone through families here, when one has been affected. In many particulars it is very unlike common contagion. But at present there is considerable obscurity about this singular malady. The laws by which it has been moving from place to place are very unlike those of the generality of epidemics.

"If the exciting cause be something in the atmosphere, which has exercised its influence from Bengal to the Deccan, how did it come directly against the southwest wind that has been blowing upon this coast since June? How does it happen that the winds from the ocean still spread the disease? And if it be something general in the atmosphere, why has it not hitherto made its appearance in some two distant parts of the province at the same time? Nothing of this kind has, I believe, been observed. It still seems to be creeping from village to village, extends for a few days, and then begins to decline."

Another extract from Kennedy's work states:—

"There are several instances recorded where the cholera has been first manifested at a place, in the attack of an individual, who had come from some other place where the disease existed. The first of an European, which occurred at St. Thomas's Mount, was of a man who had left Madras on the morning of the 15th of October. Proceeding on his journey towards Trichinopoly, in the evening he was taken ill about a mile from the Mount, brought back to the house where he had passed the day, and there died. On the 17th the wife of that person, on the 19th the owner of the house, and on the 21st his wife, all experienced attacks of cholera, but recovered. Several of the native servants also suffered. The instances of the disease appearing at

places immediately after the arrival of corps and detachments, which were suffering from it, are very numerous. For example, it appeared at Jaulnah, immediately after the junction of a party from Nagpore, amongst whom it prevailed. It appeared at Aurungabad, and at Mulligaum in Candeish, after the arrival of parties who had left Jaulnah at the time the disease was prevalent there, and amongst whom it had broken out on the march to these places. It appeared a second time at Mulligaum after the junction of the first battalion, 5th regiment, in which cholera prevailed. It appeared at Secunderabad, after the arrival of a detachment suffering from it; and it appeared afterwards in the villages through which the detachment had moved. It appeared at Ghooty, where no case had been observed for six months before, immediately after the arrival of the First Battalion, 16th Regiment, in which it prevailed with great mortality. It is remarkable, that the same formidable type of the disease which prevailed in the marching corps, was communicated to the corps at Ghooty. It also spread on that occasion to the adjacent villages. It appeared in a detachment of artillery, previously perfectly healthy, upon their encamping on the ground, which had been immediately before vacated by the First Battalion, 8th Regiment N. I. in which corps the disease prevailed; the bodies of several persons, who had died of cholera, remained exposed on the ground, when it was taken up by the artillery. Moreover, marching corps and detachments have been seized with cholera on coming to places where it was prevalent.

“An important fact which appears favorable to the notion of contagion is that the disease broke out in some places very soon after the arrival of persons ill of cholera who had recently left districts where it prevailed. Several instances of this are reported. Thus, the first place where cholera appeared after it broke out at Orenburg was, in the fortress of Razüpna, 60 miles to the westward, down the course of the river Oural. Here it commenced on the 19th September, passing over several forts and villages on the highway, which, nevertheless, we shall

presently find, were attacked subsequently; and it is said, that the first person attacked was a vintner's servant on the very day he arrived from Orenburg, and that the disorder seized several of the garrison four days afterwards. Again, in the fortress of Iletsk, 42 miles to the southwest of Orenburg, and on the verge of the Kirghis-Kaisak Steppes, the disease did not break out till the 2d of October, and first appeared soon after the arrival of a soldier, and a soldier's wife, who were taken ill on the way from Orenburg, and died on the day after their arrival at Iletsk. Three days after their death three individuals took ill in the garrison, one of them was the husband of the woman. — Another incident of the same nature occurred towards the close of the epidemic at Caramala-Gubeewa, in the northern part of the Orenburg government. This village had remained healthy till the 14th of January; but about this time a peasant arrived from a village 24 miles distant, where the disease prevailed, and died of it immediately after his arrival; whereupon this man's nearest relations were attacked; and immediately afterwards the disease spread among the inhabitants, so that in a short time 41 were attacked, and twenty died."

With regard to the direction and rate of progress of the cholera, from its source over the world, the Committee say: —

"The extension of the disease from Indostan has been gradual, never too rapid to have been carried by man; it has been in all directions, and in continued lines; it has been in opposition to the course of the winds, as well as in accordance with that course; it has been very little influenced either by climate or the season of the year; and it has continued for many years under all varieties of weather. These circumstances are not in accordance with ordinary non-contagious epidemic diseases. They may be explained on the supposition that the disease is contagious."

The Committee also report many cases where, by exclusion and cutting off all communication with the outer world, individuals with their families, and communities and bodies of work-

men, escaped either entirely, or with so few of their number attacked in the midst of the disease, as to make it noteworthy. Dr. Mulig also testifies to the same thing, and the same has been reported of some of the Italian cities and the Grecian islands, who have warned off strangers at the cannon's mouth. I mention the subject, although I have not thought it best to introduce such testimony, for the reason that it cannot be determined beyond a doubt that the freedom from the disease, which the persons named enjoyed, was the result of such exclusion and isolation. Still, as collateral and corroborative evidence, it has a good deal of weight.

If these facts are so, and the sources from whence they are derived entitle them to every credence, it is difficult if not impossible to avoid the conclusion that cholera is a transmissible and communicable disease, carried from one place to another not by any atmospheric vehicles, but by vessels, by travellers, and their baggage.

And here comes up the inquiry. In what does the contagious element of cholera consist? Upon this point we have testimony from a variety of sources, the most prominent and clear being the result of the investigations of Dr. Snow, in London, during the epidemic of 1854; the letter of Mr. Blogg to the *Medical Times and Gazette*, written from Constantinople during the height of the recent epidemic; and the facts brought out at the examination of the well at Epping, England, from which the Groombridge family derived their supply of water, and so many members of which, with the attending physician, died one after another of cholera.

The theory of Dr. Snow was, 1. That cholera is exclusively a disease of the alimentary canal. That at first the disease is confined to this, and the successive stages as they are called, are only the results of the rapid abstraction of the water of the blood from the tissues.

2. That the primary change in the alimentary canal is always induced by the introduction therein of a specific poison.

3. That this poison is exclusively contained in the intestinal contents of the infected person, that is to say, in what is purged from the bowels, and vomited from the stomach. There is nothing breathed from the lungs, nothing thrown off from the skin, that will propagate the disease.

4. That the poison is neither a gas nor a vapor, but a material substance, and exists either as a liquid or a solid. It cannot, therefore, be carried a great way by the atmosphere, and when dry, must be attached to clothing, or disseminated through water, to be carried long distances.

The modes of spreading the disease, he put into four groups,

1. The moist excreta of cholera, on the clothes and bedding of infected persons, might be carried mechanically by the vapor of water, and enter the mouth and nostrils in that form, and so be swallowed. In this way laundresses, engaged in washing the clothing of infected persons, were so readily attacked.

2. The poison might dry on infected clothing; and from such clothing, on its being unfolded or moved, the solid organic matter might escape in small substance; might be wafted a few feet in the air; and might, in fact, be absorbed through the mouth, by any one exposed to it. In proof of these two positions, may be cited the following cases: In a village not far from Marseilles, and in an isolated place, a peasant and his wife; who had not left the country, sickened and died of the disease. The woman was a laundress, and had received a bundle of linen, belonging to an individual recently arrived from Egypt, and the husband had opened the bundle and unfolded the pieces. Dr. Sayre, of New York, reports that it has been ascertained that cholera was introduced into Guadeloupe by the clothing contained in a trunk belonging to a person who died on the voyage thither from Marseilles, where the cholera then was. The washerwoman who washed the clothing died, with all her family. Attracted by the circumstances of the case, many persons came to her house, and of these several died. From this point it spread over the island. Dr. Mulig, also, asserts

that during the Crimean war, the fact that the washermen attending to the washing of the French hospitals, were attacked by cholera, was more than once confirmed.

It may also adhere to other material, which has been handled by infected persons, or been brought in contact with their excretions. The postal department of Marseilles numbers 120 persons, of whom 75 to 80 are clerks: 22 are employed at the bureau of departure, and 9 at the bureau of arrival. There has not been a single death, or even a case of sickness at the former bureau, while of the latter, nine employés have been sick, and one has died. These eight have been taken sick one after the other; this has been proved of the first five. The one who opened the despatches from the East fell sick, — was cholericé was the expression used. Another was put in his place, — the same effect, and so on up to the fifth.

Houses, also, retain the poison. After an epidemic in Vienna, in 1855, had been extinguished, the first case, on its reappearance, occurred in a house which had been used as a cholera hospital, during the epidemic.

3. In respect of nurses, persons who lay out the dead, and others in attendance, he urged that these might actually carry the poison on their hands, and infect themselves by taking food when their skin was not properly clean. In Constantinople, no less than 27 physicians and medical assistants were attacked and died, during their attendance on the disease; and in Paris, and at Toulon, similar results followed. Lastly, the very utensils — such as basins and cups — used by the sick, might convey choleraic matter, or even the cloths on which such utensils, imperfectly washed, have been dried. In a letter from Dr. Sayre, resident physician to the city of New York, to the *New York World*, January 23, 1866, it is stated that Dr. Rich, who had charge of the cholera lazaretto in Malta and the Balearic islands in 1831, noticing that the attendants who removed the excretions were being attacked by the disease, covered the surface of the contents of the vessels used to remove

it, with oil, and had it disinfected by chlorine gas. After this was done, no new cases occurred.

Mr. Blogg writes, "I can but think that the cholera was contagious. In one instance, the clothes, mattresses, &c. of the sick, were washed at a fountain, and unfortunately, the wastepipe being broken, the foul water communicated with the clean, and in one day sixty people died at Tatavola, a small portion of the city which was supplied by this infected stream."

But perhaps the most striking instance of the propagation of the disease is to be found in the history of the Broad Street epidemic, so called, in 1854. In this case, there was a well in Broad Street, London, into which the contents of a sewer had been percolating for months. Of this water, hundreds of persons had been drinking, and although cholera was present in other parts of London, there were no cases in this locality. At last a case of cholera occurred, and by means of the sewer, the excretions of the patient were mingled with the water of the well. *Within three days, more than 500 persons, who used the water from this particular source, were attacked.* Acting on his belief regarding the cause of cholera and its communicability, Dr. Snow removed the handle of the pump in this well, thus cutting off the use of the water, and the disease immediately disappeared.

The same results were also noticed in the development and mortality of cholera in the south districts of London during the same year. In commenting on this, the journal from which the above quotations are made (*Medical Times and Gazette*, Oct. 7, 1865), remarks, "The evidence on this point is not speculative, like most of that which relates to cholera, but is founded on demonstration, and on a larger series of corroborative facts than ever was brought to bear on a medical inquiry."

The facts observed in the epidemic at Epping, show that between September 24, when Mr. Groombridge was attacked, and October 9, when the last death occurred, eleven persons were seized, of whom eight died. Here the malady was stayed.

The districts contiguous to the house were not affected, and no one contracted the disease who had not been connected with the family in some way. The investigation into the water supply shows the reason why. The house was situated on a hill, at a distance from any other dwelling, between the well from which the family derived their water, and the cesspool. There was a leakage from the sewer into the well, and the choleraic matter from the first patient was thus mixed with the water subsequently drank by all who came to the house. How the contagion came, in the first place, is unknown, but it is worthy of mention, that Mr. Groombridge and his wife had been at Southampton, where the cholera was at the time.

“ At the meeting of the *Société Médicale des Hospitaux*, at Paris, held November 22, M. Hérard reported the case of a young girl affected with cholera for two weeks, who continued to vomit daily about two quarts, of a liquid transparent as water, and but slightly differing from that fluid in composition. Of this liquid, M. Robin injected a quantity into the trachea of healthy dogs, producing vomiting, liquid evacuations, and chills; in short, symptoms strictly analogous to those of cholera, and terminating in the more or less speedy death of the animals. The same result followed injection with the liquid portion of the blood drawn from cholera patients during the period of reaction. Injected into the stomach, these symptoms did not follow, a circumstance probably due, according to M. Robin, to the fact that the liquids were digested, and thus lost their toxic properties. In one case, however, a dog which had by chance devoured a large quantity of the alvine dejections of a cholera patient, died with all the symptoms mentioned above. In this case, it was supposed that the stomach was unable to digest the whole of the morbid excretion, and the remainder was absorbed with all its deleterious properties, as in the case of injections into the trachea.” (*Boston Medical and Surgical Journal*, from *L'Union Médicale*.)

Tested by the theory and facts thus presented, the strange,

and apparently erratic and almost arbitrary, course of the disease, so much dwelt on by writers hitherto, both in this country and abroad, resolves itself into a natural sequence of cause and effect. The well-known leaps which cholera has taken, as well from city to city as from one part of a city to another locality within the same limits, omitting all regular progression to single out individuals and places, often at long distances apart, and having no apparent connection with each other, are satisfactorily explained upon the supposition that the materies morbi, the choleraic poison, was, by some material vehicle, carried to its destination, there to generate and develop into maturity.

For, if it was produced by any atmospheric change, a want of ozone, for instance, or an aerial tide of infection, a great atmospheric wave, as has been so often quoted, why should it single out the cities on the coast or along the great highways, not always proceeding in the direction of the wind, but radiating to every quarter of the compass, and yet not, in a single instance that is recorded, overspreading a *district*? For instance, if cholera came on the wings of that East wind so often remarked and mentioned as blowing for weeks consecutively before the outbreak of the last epidemic in this region, why did it not spread *generally*, as far to the westward over the State of Massachusetts, among the small villages as well as the more populous towns, as that wind prevailed? But that it did not so spread, and that it followed its usual mode of selection, is as well known, as is the fact of its appearance in those of the neighboring cities and towns with which Boston was in the most direct communication, — some to the north, some to the south, some to the west, and some even to the northeast, almost directly in the teeth of the current.

Cholera, then, is contagious; not in the ordinary sense of the word, not as smallpox, or what are termed the eruptive fevers are, but in the sense of inoculation, by the introduction of the germs of the disease into the alimentary canal. Avoid

this, and infection and the spread of the disease are impossible; it will expire by limitation. The public should be taught to fully appreciate this fact; for, with a thorough understanding of the mode of its propagation, there comes, at the same time, a knowledge of the remedy. Cleanliness — scrupulous, exact, and complete cleanliness — is the perfect antidote, the impene- trable shield of safety. For want of this, the poor, the squalid, and the careless, imbibe the seeds of the disease, which are found in the clothing saturated with the poison, the unwashed person, the unclean vessels, and in the close, unventilated rooms, impregnated with the exhalations from their crowded inmates, and where the air is full of death.

For want of this, also, those who are themselves clean, suffer by contact with others who carry about them the poison of the disease, and death comes in a most mysterious way.

For the same reasons, those cities where the water supply cannot be contaminated by admixture with the contents of the sewers, will suffer much less, and the disease, when it does appear, be more limited, and even isolated, than those which are differently situated in this respect. It also follows, and with the certainty almost of a mathematical demonstration, that, if the first foothold of cholera can be prevented, a community may be kept in perfect immunity.

And here comes up the much vexed question of quarantine, — a question made exceedingly difficult of satisfactory solution by the conflicting interests involved. The interests of the com- mercial public and the welfare of the community are often at war with each other; but it seems to me that, guided by the light which the evidence above presented affords, a practical solution, at least, can be reached, if not a result which will satisfy every theorist.

If the disease is one which requires a personal element for its initial term, all restriction may, with safety, be removed from articles of freight alone. It is with the passengers and their personal baggage, not the merchandise in the hold, that the

danger lies; so that, in the case of a vessel arriving, on board of which the disease has made its appearance, or which has sailed from a port where cholera existed at the time, to disembark the former at a suitable quarantine station, and purify those portions of the ship which have been occupied by them during the voyage, will be ample and sufficient protection. The merchandise may go free.

The following extract from the Committee's Report, presents the subject so fully that I quote the section entire, which relates to the "capability of merchandise to convey and afterwards communicate the infective germs of cholera."

"There is no question in the whole range of sanitary police, on which so many and such irrefragable facts can be brought to bear, as on this; derived, too, from the most authentic and recent sources. Seven hundred and thirty-two ships, loaded with hemp and flax from infected ports of the Baltic, arrived at the different quarantine stations in this country (England) between the 1st of June and the 31st of December, 1831. Many vessels also arrived laden with wool and hides, yet not a single case of cholera occurred on board any of these ships outside the Cat-tigate sea, nor amongst the people employed in opening and airing their cargoes in the lazarets.

"At the hemp and flax wharves in Saint Petersburg, where several thousand tons of these articles arrived during the spring and summer of this year, from places in the interior where cholera existed at the time of their departure for the capital, the persons employed in breaking or sorting, and who generally passed the night amongst the bales, did not suffer so early in the season, nor so severely, as other classes of the general population.

"The same observation holds good with respect to all the ropewalks of Saint Petersburg; and the imperial manufactory of linen cloth at Alexandrofsky, where all the yarn used is spun from flax bracked and hackled on the spot.

"Struck with the importance of the above, and other similar and authentic facts connected with the sanitary history of cholera;

“ Holding in view also the unnecessary embarrassments to every kind of intercourse, caused by the adoption of plague precautions against individuals, communities and merchandise affected with, or suspected of, cholera only ;

“ The strong inducements to elude sanitary restrictions, furnished by their own severity ;

“ The inefficiency of cordons by land, from the impossibility of their being made perfect, except by a system of coercion entailing greater evils than the disease itself ;

“ The panic and other dangerous moral, as well as physical effects, caused by vexatious insulations of families and communities ;

“ Some of the most commercial nations of Europe, as well as those still exempt from, as those already infected by, spasmodic cholera, have lately reduced, very considerably indeed, the quarantine restrictions which they had hitherto directed against that particular disease.

“ Lubeck, a territory perfectly exempt from cholera, reduced its quarantine upon persons and merchandise arriving from infected ports, first from forty-one to twenty-one, and then to ten days.

“ A similar reduction has taken place at Copenhagen.

“ In Prussia, persons and merchandise from infected places are subject to a detention of only five days.

“ The Board of Health at Genoa have modified their quarantine code, taking as the basis of their new arrangements, the maximum of the period of incubation of cholera, as determined by their own medical commission, already quoted.

“ Guided by what experience has already established, as to the laws which seem to regulate the propagation of cholera ; and having in view the enlightened decisions which the sanitary authorities of other countries have come to on this subject, the Central Board of Health feel themselves justified in giving it as their opinion :—

“ 1. That the maximum of sanitary restriction, or quarantine

of observation, for an individual in health, but suspected of carrying the infective germs of spasmodic cholera as yet latent in his organization, need not exceed ten days.

“ 2. That the period of separation from the healthy, of an individual ascertained to be but just convalescent from cholera, need not exceed twenty days.

“ 3. That ordinary diarrhœa, continuing one or more days, being often the first symptom or cholera, persons arriving from infected places, laboring under even the mildest degree of purging, should not be admitted to free pratique, before the eighth day after perfect recovery from the same.

“ 4. That the clothes, bedding, effects, and sleeping places, of all persons on board vessels from infected ports, ought to be opened, aired, and purified during three days after their arrival, although the length of the voyage may have exceeded the period of quarantine adjudged in such cases to healthy ships and unsusceptible cargoes.

“ 5. That the longest period of detention, for airing and purifying merchandise of the most susceptible class, and arriving under the most suspicious circumstances, need not exceed fifteen days, to be counted from the day on which the airing may, *bona fide*, have commenced.

“ Finally. The Board see no reason to believe that the above suggestions, directed against spasmodic cholera, alone, require any modification in reference to climate.”

The length of time required for the disease to show itself, its period of incubation, is undetermined. Those who drank in the poison with the water from the well in Broad Street, London, sickened within three days.

The British Medical Commission, who were sent to Russia in 1832, as the result of their observations there, reported (Committee's Report, p. 129) :—

“ That in the cases seen, in all of which the time intervening between an only exposure to infection and the subsequent

development of the disease was most accurately marked, the period of incubation ranged between one and five days.”

The Genoese Medical Commission, sent to Hungary and Vienna to study the nature and history of spasmodic cholera, state, in two distinct reports to the Sardinian Government, their decided conviction, derived from protracted observation and personal experience in cholera quarantine establishments, that those who have absorbed the germs of the disease are generally attacked before the *third*, and always before the *fourth*, day.

In 1848, it broke out on shipboard in two vessels bound to this country from Europe (see p. 12), one of which had been sixteen, and the other twenty-seven, days at sea. These latter cases show the longest time of incubation on record; but it is by no means proved that the passengers did not contract the disease by exposure to its contagious principle after they embarked, instead of before they quitted the land. Indeed, in so far as any direct evidence goes, but a comparatively short time is necessary to show, by the premonitory symptoms, that the disease is in the system. But, be this as it may, it is far better that a few persons should be detained a day or two too long at quarantine, than that a whole community should be exposed to this most fearful scourge of the human race, from any false notions of sympathy.

A question comes up very naturally at this stage of the discussion, if cholera is a contagious disease, of what real effect are sanitary measures so called? How do they operate to prevent infection? The answer is obvious. However much men may differ in their assent to the theory and its connection with the facts above cited, experience teaches that cholera usually, with few exceptions indeed, prevails to the greatest extent and with the highest mortality in those sections, and among that portion of the population where the greatest amount of insalubrious conditions prevail, and there is the least regard to personal cleanliness. Not that isolated cases will not probably be found to

occur, induced in the manner already specified, but the great fact, nevertheless, remains, that amongst the ill-lodged poor, the squalid and the filthy, the cholera finds its most abundant food.

The prime object being, under all conditions, to remove as quickly and as completely as possible from contact with the healthy, the excretions of the sick, it follows necessarily that if the drainage is sufficiently free to convey away the poisonous material emptied into its channels, and cleanliness both personal and general be enforced, the danger from contagion will be reduced to the lowest point.

Instead then of affording any excuse for laxity, it prompts to the most rigid enforcement of the sanitary code, with an assurance, also, that no longer blindly groping after an unknown cause, and adopting measures upon a general principle only, we can march at once to the source of the evil and strike at its very vitals. Actuated by this conviction I addressed a letter to Dr. Howard F. Damon, of this city, for a long period Superintendent of the Boston Dispensary, asking information on the following points:—

1. The number of cases and the varieties of bowel complaints, so called, which have been reported to the Dispensary for treatment during the summer months?

2. In your opinion how far are these to be traced to deficient drainage, accumulation of filth in the premises, and an over-crowded state of the tenements?

His answer is appended to this Report, together with a table and map, showing the relative unhealthiness of various localities. It speaks for itself, and most unmistakably points out the sections of the city where the cholera may be expected to prevail in its greatest intensity, and where the greatest efforts of the Internal Health Department must be made.

A striking coincidence will also be noticed between the districts where the greatest amount of disease prevails which springs from bad location, bad drainage, and over-crowding, and those portions of the city which suffered most in the epi-

demic of 1849, and which are also indicated on the map appended to the "Report on Cholera," made by my predecessor in office in that year (City Document No. 66), a copy of which is herewith presented.

Respectfully submitted,

WILLIAM READ, M. D.

City Physician.

BOSTON, January 25, 1866.

DR. READ: —

DEAR SIR: In reply to your request made some three months ago to me, when Superintendent of the Boston Dispensary, for my testimony in regard to the prevalence of certain diseases, and their dependence upon local causes, permit me to answer as follows: —

From my position as a general observer of the diseases of the poorer classes, during the last four years, many prominent facts have come to my notice. Amongst these, certain points have seemed to me to be the centres of many of those diseases which are, to a great extent, dependent upon local causes. I shall confine my remarks for the most part to the intestinal diseases of children, — diarrhoea, cholera infantum, and dysentery. These diseases appear to depend in a great measure upon two very distinct causes of insalubrity, — overcrowding and imperfect drainage. In some localities both of these causes prevail. Let me indicate some of these unhealthy districts, with their respective causes of insalubrity.

1. The region bounded by East Dover Street, Harrison Avenue, Curve Street, and the water. This is both overcrowded and imperfectly drained. The streets are long and narrow, and the houses in many instances are crowded and filthy. In many of these houses the sinks are in the entries, or in the rooms constantly occupied, and the waste pipes which are immediately connected with the drains are frequently left open. The tide penetrates everywhere beneath this region daily, and prevents the waste water from finding an exit for several hours.

2. The next region of importance is bounded by Curve, Hudson, Kingston, and Summer streets and the water. The conditions are nearly the same in this region; except it is more crowded and filthy.

3. The next region is bounded by Summer, Devonshire, and

Milk streets, and the water. Federal, High, and Williams streets, are low and overcrowded. Portions of Purchase, Belmont, and Oliver streets are overcrowded and filthy; but the drainage is better.

4. This region comprises portions of the North End. Overcrowding and filth prevail to the greatest extent in some of these localities. North, Commercial, and Stillman streets are exceedingly overcrowded and filthy.

5. This region includes Nashua, Billerica, and Andover streets; a part of Friend, South Margin, and other streets in the vicinity. This district is low, crowded, and filthy.

6. This region is bounded by Dover, Suffolk, West Orange, and Tremont streets. Portions of it are wet, crowded, and filthy.

7. The next region comprises Warren, Eliot, and Church streets. Portions of these streets are overcrowded, and the inhabitants are filthy.

The Church Street region is quite low and imperfectly drained, but is not crowded by so filthy a class of people. It will be noticed that nearly all of these unhealthy regions are made land. The only exceptions are a few overcrowded streets about Fort Hill and at the North End.

Emanations from drains and the soil, overcrowded dwellings and filth, seem to me to be the sources of a large percentage of the diseases of these regions. The South Cove and the region of the Old Millpond have thus contributed a large portion towards the disease and mortality of the city.

Respectfully submitted,

HOWARD F. DAMON, M. D.

WM. READ, M. D., *City Physician.*

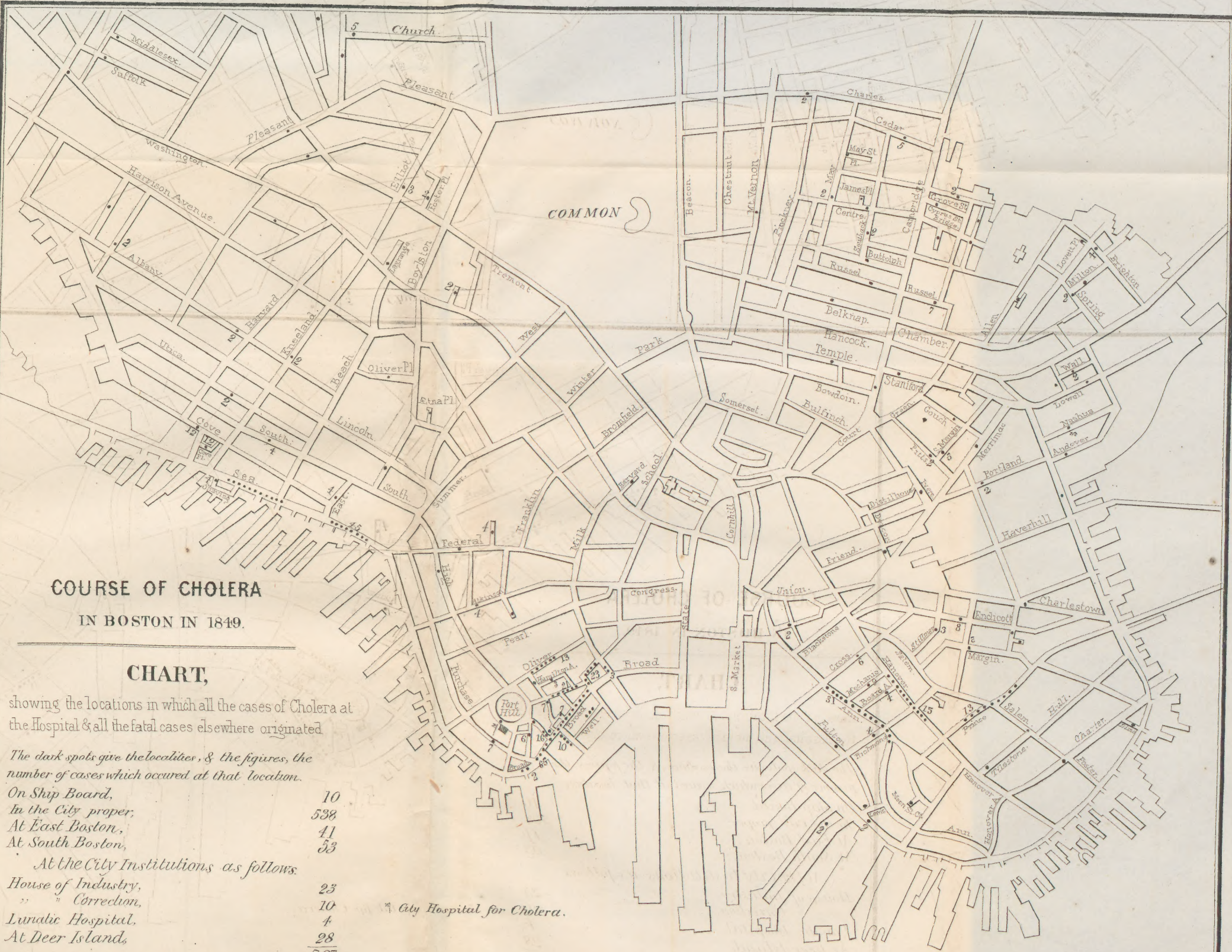
Localities of One Thousand Cases of Intestinal Diseases, (Diarrhœa, Cholera Infantum, and Dysentery,) in Children, for the Months of July, August, and September, 1863-4, and 5, compiled from the Records of the Central Office of the Boston Dispensary.

Albany,	13	Canal,	5
“ Place,	15	Charter,	4
Athens,	6	Chapman,	6
A,	9	Charlestown,	2
Alden Court,	1	Carney Place,	3
Andover,	1	Carver Place,	3
B,	3	Commercial,	11
Bennet, S.	2	Channing,	4
Broad,	14	Chapel Place,	5
Belcher Lane,	2	Castle,	2
Beach,	7	Cross,	6
Billerica,	5	Cedar, South,	1
Boylston Square,	5	D,	2
Bridge,	2	Dorchester,	1
Broadway,	3	“ Avenue,	2
Brighton,	2	Dedham, East,	3
Bolton,	1	“ West,	2
Bowdoin, South Boston,	2	Dove,	2
Battery,	2	Dover,	1
Chambers,	1	“ Place,	1
Clark,	1	E,	1
Cedar, West,	2	Essex,	15
Columbia,	2	“ Place,	3
Cherry,	1	Eliot,	9
Curve,	2	“ Place,	1
Cove Street and Place,	35	Endicott,	4
Congress,	6	“ Court,	1
Colony,	1	East Street Place,	2
Church Place,	4	Emerald,	1

Eddy Place,	1	Kendall,	1
Federal,	60	Lincoln,	19
“ Court,	5	Lenox,	2
First,	13	Langdon Place,	2
Foundry,	2	Lehigh,	4
Fifth,	7	Lowell Place,	3
Fleet,	1	Lane Place,	1
Fourth,	5	Lime Alley,	1
Friend,	5	Middlesex,	20
Fabin,	2	Milldam,	2
Genessee,	8	Morton,	3
Grove, North,	1	Monroe Place,	1
Gardiner,	1	Margin, South,	3
Gold,	7	Meander,	1
Gouch Street Place,	1	Minot,	1
Gridley,	1	Margin, North,	2
Goddard,	4	Milton Place,	7
Hobbs Wharf,	2	Mechanic Court,	1
Hamburg,	10	Merrimack,	2
High,	28	Malden,	1
Harrison Avenue,	20	Nashua,	15
Hamilton,	4	North,	8
“ Alley,	2	Northampton,	4
Hanover Avenue,	5	North Square,	2
Hartford Place,	2	Napier,	2
Hudson Place,	1	Oswego,	24
Hull,	1	Oneida,	36
High Street Place,	1	Orange East Way,	11
Hawley,	1	Orange Lane,	4
Havre,	2	Oliver,	7
Holden Court,	1	Olive Place,	1
Irving,	1	Ontario,	9
Kingston,	5	“ Street Place,	1
“ Court,	5	Olney Place,	1
Kneeland,	19	Purchase,	22

Purchase Place,	1	Sturgis Place,	1
Pearl Place,	5	Sixth,	2
Power's Court,	3	Shawmut Avenue,	2
Prince,	5	Troy,	11
Pepperell Place,	2	Tyler,	6
Portland,	3	Third,	8
Plymouth Place,	1	Tileston,	1
Pleasant	2	Tyler Court,	1
Preble,	1	Trainer's Court,	1
Quincy,	6	Tremont,	2
" Place,	3	Thatcher,	2
Rochester,	19	Tufts,	2
River,	1	Trumbull,	1
Seneca,	18	Utica,	18
Suffolk,	5	" Place,	9
Second,	28	Union Park Street,	1
South,	24	Vine,	2
Spear Alley,	3	Vinton Court,	2
Stillman,	14	Warren,	11
Sullivan Place,	8	Williams,	10
Swan,	5	Washington Square,	7
" Street Place,	1	Wharf,	2
Shaving,	5	Washington Avenue,	4
Sudbury,	1	Wendal,	1
Silver,	4	Washington Village,	1
Southac,	2	Waltham East,	1
Salem,	1	Scattering,	6
Sister,	2		
Salutation,	1		1,000





**COURSE OF CHOLERA
IN BOSTON IN 1849.**

CHART,

showing the locations in which all the cases of Cholera at the Hospital & all the fatal cases elsewhere originated

The dark spots give the localities, & the figures, the number of cases which occurred at that location.

On Ship Board,	10
In the City proper,	538
At East Boston,	41
At South Boston,	53
At the City Institutions as follows.	
House of Industry,	23
" Correction,	10
Lunatic Hospital,	4
At Deer Island,	28
Fatal cases, 611.	707

City Hospital for Cholera.



LOCALITIES OF
ONE THOUSAND CASES OF INTESTINAL DISEASES
 (DIARRHŒA, CHOLERA-INFANTUM & DYSENTERY)
 IN CHILDREN, FOR THE MONTHS OF JULY, AUGUST & SEPT. 1863, 4 & 5,
 COMPILED BY HOWARD F. DAMON, M.D.
 FORMERLY SUPERINTENDANT OF BOSTON DISPENSARY.

Lith of J.H. Bufford's & Sons.

